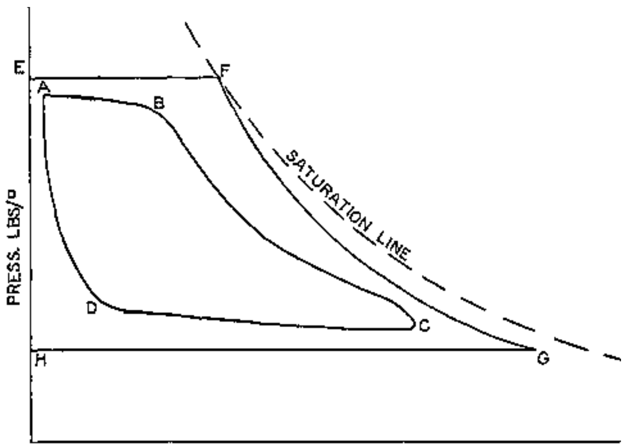
capable of performing a definite and calculable amount of work, which consists of the work done before cut-off plus the exact equivalent of the difference between the heat contained in the steam at cut-off and the heat which it contains at exhaust.

Fig. 2 shows an ideal Rankine cycle (EFGH) around the actual cycle ABCD. In an actual engine, a diagram such as indicated by the inner line would be obtained. In the first place there would be loss of initial pressure during admission, due to the throttling in the ports and past the valve edges, as shown by the sloping line. Some of the steam would be condensed as explained before, and the volume of steam at cut-off would be less than that shown by the Rankine diagram. The steam would then expand



VOLUME C. FT.

Fig. 2.—Indicator Diagram with Rankine Cycle

under the disturbing influence of the presence of water and the effects of conduction and radiation, and expansion would not be continued to the line of back pressure, especially in the case of condensing engines, owing to the impracticably large cylinder necessary, which would cause more work to be absorbed by friction than would be given by complete expansion. The pressure of the steam in the cylinder during the exhaust stroke would be higher than the back pressure due to the effect of friction through the ports, and there would be some compression at the end of the stroke into the clearance volume.. This volume is represented by the horizontal distance between the beginning of the admission line and the line of zero volume in the Rankine diagram.

The difference in area between the two diagrams shows the losses which take place in a real engine, and is a measure of its inefficiency compared with an engine working on a Rankine cycle.

A saturation curve shown by broken lines has been added to fig. 2. The horizontal distance at any point between this curve and the expansion curve of the Rankine diagram indicates the progressive wetness of the steam due